CLAIMS

1. According to a first aspect of the invention there is provided imaging apparatus comprising:

   a radiation source for generating an imaging beam;

   a detector responsive to the imaging beam to generate image signals and comprising an array of pixels arranged in rows and columns, each pixel being responsive to incident radiation to generate an output signal;

   a drive arranged to move the radiation source and the detector relative to a subject in a scanning direction;

   an adjustable collimator arranged to vary the width of the imaging beam in the scanning direction; and

   a control system responsive to adjustment of the collimator to combine output signals of groups of two or more pixels in the detector, thereby to optimize a selected characteristic of the image signals.

2. Apparatus according to claim 1 wherein the control system is arranged to combine the output signals of groups of pixels comprising greater numbers of pixels as the collimator is adjusted to increase the width of the imaging beam in the scanning direction, thereby to increase the contrast resolution of the image signals for a given spatial resolution.

3. Apparatus according to claim 1 or claim 2 wherein each group of pixels defines a super pixel comprising an array of fundamental pixels, the number of fundamental pixels in the array being selected according to a corresponding collimator setting.

4. Apparatus according to claim 3 wherein the relationship between collimator settings and the number of fundamental pixels in an array defining a super pixel is stored in a lookup table and related to respective ones of a plurality of different x-ray procedures.

5. Apparatus according to any one of claims 1 to 4 wherein the control system is arranged to measure the signal level of the detected imaging beam and to adjust the collimator slit width to maintain the detected signal level at or close to a desired setpoint.

6. A method of operating imaging apparatus of the kind having a radiation source and an associated detector which are moveable relative to a subject, the method comprising:

generating an imaging beam from the radiation source;

moving the radiation source and the detector relative to a subject in a scanning direction to generate output signals from each of a plurality of pixels of the detector;

adjusting a collimator to vary the width of the imaging beam in the scanning direction;

detecting the setting of the collimator; and

combining the output signals of groups of two or more pixels according to the setting of the collimator, thereby to optimize a selected characteristic of the image signals.

7. A method according to claim 5 comprising combining the output signals of groups of pixels comprising greater numbers of pixels as the collimator is adjusted to increase the width of the imaging beam

in the scanning direction, thereby to increase the contrast resolution of the image signals for a given spatial resolution.

8. A method according to claim 7 or claim 8 wherein each group of pixels defines a super pixel comprising an array of fundamental pixels, the number of fundamental pixels in the array being selected according to a corresponding collimator setting.

9. A method according to claim 8 wherein the relationship between collimator settings and the number of fundamental pixels in an array defining a super pixel is stored in a lookup table and related to respective ones of a plurality of different x-ray procedures.

10. A method according to any one of claims 7 to 9 including measuring the signal level of the detected imaging beam and adjusting the collimator slit width to maintain the detected signal level at or close to a desired setpoint.

11. A collimator for adjusting the effective width of an imaging beam generated by a radiation source, the collimator comprising:

first and second shutter elements arranged side by side to define a slit through which radiation emitted by the source can pass;

a drive arranged to move the shutter elements in a direction parallel to the slit; and

a guide mechanism comprising first and second tapered surfaces arranged to cooperate with respective tapered surfaces on the first and second shutter elements, so that operation of the drive varies the width of the slit.

12. A collimator according to claim 11 wherein both the shutter elements are arranged to move co-centrically with respect to a centre line that passes through the gap between them, to obtain an optimum umbra to penumbra ratio of the x-ray beam on the detector.

13. A collimator according to claim 11 or claim 12 wherein each shutter element comprises a strip of radiation-opaque material and a supporting body defining the respective tapered surface.

14. A collimator according to any one of claims 11 to 13 wherein the drive comprises a motor and reduction drive with a mechanism arranged to impart linear motion to the shutter elements.

15. A collimator according to any one of claims 11 to 13 wherein the drive comprises a solenoid.

16. A collimator according to any one of claims 11 to 15 wherein the shutter elements are biased towards a position in which the width of the slit is a minimum.